

# Searching



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Postal Address: Box 8500, Ottawa, Canada K1G 3H9  
Head Office: 60 Queen Street, Ottawa, Canada

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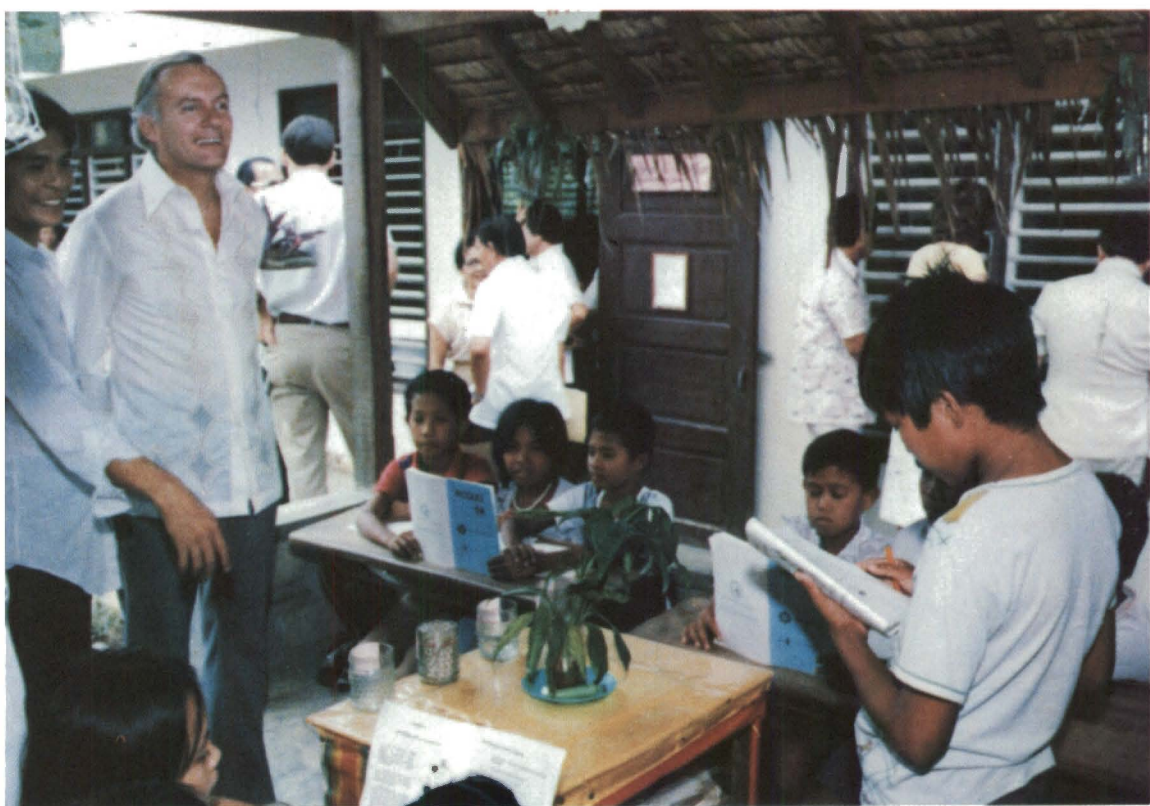
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*IDRC President Ivan L. Head sees "learning modules" in action in the Philippines.*



As 1980 commences, most of the people of the world remain poor. In broad terms, little progress has been made in reducing worldwide the number of persons who exist in abject poverty. Quite clearly, the Second Development Decade has not met the expectations created at its outset 10 years ago. Yet the decade has not been a total failure. Much has been learned about the development process. Properly employed, the knowledge can contribute a good deal to the solution of the problems that beset so much of the world.

It is now increasingly accepted, for example, that healthy, educated people are the most effective of all development instruments; indeed, are the only effective development instruments. Such persons are capable of making wise choices. Increasingly, they have the means and the incentive to solve problems. They become the architects of their own improved future. The human condition is more than the beneficiary of development; it is the primary engine in the exercise.

Time is a critical element in this exercise, for between North and South there now exists a developmental divide. Its existence is reemphasized in every session of the United Nations General Assembly and in virtually every inter-governmental conference. In no other direction and over no other issue does there exist such a definite and seemingly insurmountable barrier. Again and again, its existence foils activities designed to create a degree of international concord.

More significant than the failure of governments to reach agreement across the divide, however, is the popular mood of indifference now so prevalent in the North and the sense of frustration now so evident in the South. This combination damns the efforts of even the most determined and encourages agitators and adventurers. It is no coincidence that unrest and instability are found almost exclusively in the Third World.

To surmount this developmental divide, there is required a measure of human involvement in the North and a measure of human benefit in the South. In short, a perception of the human condition much more intimate and much more subjective than that found in many of the earlier, macroeconomic, development treatises. A dedication to the immediate: to the practical problems that deny to human beings better health, better nutrition, better shelter, better education.

Research can lead to those results, but the research must be rooted in the needs of the developing countries. It must reflect their needs, employ their skills, reflect their priorities. And in the process it must enhance their indigenous competence.

The International Development Research Centre was created to assist in that process. This booklet tells the story of how the Centre is going about its task.

Ivan L. Head  
*President, IDRC*







**When was IDRC set up?** The Centre was established by an Act of the Canadian Parliament in May 1970. The first meeting of the Board of Governors took place in October 1970.

**Why was it set up?** In the words of the Act "to initiate, encourage, support and conduct research into the problems of the developing regions of the world and into the means for applying and adapting scientific, technical and other knowledge to the economic and social advancement of those regions."

The Centre was established as a public corporation so that it would have the greatest possible measure of flexibility and autonomy while still being accountable to Parliament. Its funds are in the form of "untied aid," which allows it to secure the best available professional skills and to finance projects in the most appropriate way regardless of the origin of the research workers and the source of equipment.

To increase the problem-solving capacity of developing regions, IDRC places heavy emphasis on support for research workers living and working in the region. The great majority of projects are being carried out in the developing countries under the direction of a local scientist or administrator. Some research is financed by the Centre in Canada, at universities and elsewhere, in support of field projects in the developing regions. Most projects include a training element, and the Centre's Human Resources Awards Program also provides for the training and development of young professionals.

*A volunteer teacher conducts classes at an experimental Egyptian village school.*

**How much has been done?** From October 1970 to March 1979 the Board approved support for 849 projects and supplementary grants in 100 countries at a total cost of \$154 million. A few projects involve expenditures of more than \$1 million, but others involve less than \$5000; the average grant is less than \$200 000. Some 332 projects have been completed.

**What are the principal sectors in which research has been supported?** Four program divisions are responsible for developing and supervising research support. They are Agriculture, Food and Nutrition Sciences; Health Sciences; Information Sciences; and Social Sciences.

**How international is IDRC?** The Board of Governors consists of 11 Canadians and 10 non-Canadians. Six Governors are drawn from developing countries.

The Centre has regional offices in Singapore, Bogota, Dakar, and Cairo — all of which are headed by nationals of the region.

**How does it fit in with the work of the Canadian International Development Agency?** There is no formal relationship between CIDA and IDRC. IDRC has been the managing agent for several CIDA grants in agricultural research. Staff from each organization attend the other's project review committee meetings. In general, IDRC supports the more innovative and risky research and passes to CIDA proposals for larger-scale support of projects incorporating proven new technologies.







In the field of development everything connects. With almost mechanical precision one problem leads surely to another, and another, and another, until the circle is completed.

Take overpopulation, for example. Overpopulation leads to food shortages, which lead to malnutrition. Malnutrition leads to poor health and susceptibility to disease, especially among infants. High infant mortality may be compensated for by high birth rates, meaning more mouths to feed — in a word, overpopulation.

It is like an absurd game. Pick a problem, any problem, and it will lead you to another. Fortunately it also works in reverse: well-fed people are healthy people who can work their farms to produce the food they need to keep their families healthy. These are oversimplifications, to be sure, but they illustrate what IDRC has been attempting to do for the past 9 years: to help people to help themselves break out of the vicious cycle that is underdevelopment.

Later chapters in this *Review* deal individually with the work of the four program divisions in the search for appropriate solutions to the problems of the Third World. While reading them, though, bear in mind the connections. Malnutrition is a health problem and a social problem as well as an agricultural one. Water supply and sanitation may be the responsibility of the health scientists, but irrigation and fertilizer concern the agriculturists, and their use is a subject for study by the sociologists. The work of the information scientists cuts across all factorial boundaries.

The Centre's projects are grouped

*Improper water use: another link in the chain of underdevelopment.*



*IDRC exhibit at the Ontario Science Centre attracted all ages.*

under four divisional headings for operational convenience. These divisions are the component parts of an overall program designed to assist the countries of the Third World to adapt science and technology to solving their own problems. The underlying concept is now almost a decade old. That it is still a very contemporary concept was amply demonstrated by the amount of interest in the IDRC model shown by delegates to the United Nations Conference on Science and Technology (UNCSTD) in Vienna in August. And if imitation is the sincerest form of flattery, the Centre should be flattered by the similarities between its aims and those of the proposed new United States Institute for Scientific and Technical Cooperation.

What the developing countries asked for at UNCSTD was a new direction for scientific and technical aid programs during the 1980s and beyond. They called for action on the part of the developed countries to “support and

facilitate” their efforts to achieve development through “the establishment of endogenous scientific and technological capacities.”

The Conference secretary-general was Joao Frank da Costa, a Brazilian who



*Delegates at UNCSTD: “We must have our own science and technology.”*



heads his country's Office of Science and Technology. Mr da Costa believes that development means a lot more than just economic growth; it also involves a host of political, cultural, social, and other factors. So there can be no one

technological solution for all the developing countries.

"Each country must have its own science and its own technology," said Mr da Costa. "We are not really dealing with aid at the UNCSTD and we are certainly not dealing with charity. The idea is to make it possible to set up a science and technology structure in each developing country so that it can solve its own problems in its own way."

That idea paraphrases the IDRC's own objectives to "assist the developing regions to build up the research capabilities, the innovative skills, and the institutions required to solve their problems." Canada recognized the need 9 years ago and responded by establishing IDRC. At Vienna in 1979 Canada pledged fresh funds — up to \$12 million in time — to support closer cooperation between Canadian scientists and their Third World counterparts. The Government of Canada has invited IDRC to become "lead agency and national focal point" for this new program. That invitation has been accepted in principle by the Board of Governors and will be the subject of detailed discussions in the year ahead.

By sheer accident (for it was originally planned to take place a year earlier), UNCSTD was held during the UN's International Year of the Child. In any event, the timing was not inappropriate, for it served as a reminder of the connection between theory and practice. It does no harm for people discussing science and technology policies and programs to remember, for instance, that in the Third World one child in 10 will not live to see a first birthday, that 110 million children under age 5 live in poverty, that 160 million do not have enough to eat, that 140 million have no access to health facilities, and that fully half of the children of the developing world receive little or no schooling. Everything connects.

One of the slogans coined for the International Year of the Child sums it up in just eight words: "The future is theirs; the responsibility is ours." The search for solutions goes on.









## Agriculture, Food and Nutrition Sciences program

The Agriculture, Food and Nutrition Sciences Division is the largest of the Centre's four program divisions in terms of the number of projects it supports and the size of its project budget. Since 1970 the AFNS Division has had responsibility for about 40 percent of the Centre's project spending.

The arid and semi-arid regions of the developing world are the main target areas for the AFNS program, and its overall objective, simply stated, is to increase food production in these regions and, in doing so, to improve the health and economic well-being of the rural poor.

Thus there is an emphasis on research to improve the yields of traditional crops such as sorghum, millet, food legumes, oilseeds, and root crops. These basic crops, which provide subsistence for hundreds of millions of people, have been largely neglected by agricultural researchers in the past.

The Division is a member of the Consultative Group on International Agricultural Research, which supports a global network of specialized international agricultural research centres, and much of its research support is linked, directly or indirectly, to the work of these centres.

The Division's program of work is divided by discipline into five programs:

- Crop sciences, especially crops of the semi-arid tropics and multiple cropping systems;
- Animal sciences, with emphasis on livestock diseases and management, pasture improvement, and by-product utilization;

- Fisheries, mainly aquaculture, but including also artisanal fisheries, study of fish diseases, and utilization of neglected species;
- Forestry, particularly savanna forestry, agroforestry, and forest product utilization; and
- Postproduction systems for food processing, storage, preservation, distribution, and use in the home.



The Division has an associate director responsible for each program. The director is Joseph H. Hulse, who has held the position since joining the Centre in 1970.

### The year in brief

Sixty new projects for the AFNS program were approved during the fiscal year 1978–79, with grants totaling some \$11 million. Although the general organization of the program remains basically unchanged, there has been a continuing change in the emphasis and activities in some areas of research, such as the postproduction systems program and the animal and crop sciences program. Examples are highlighted elsewhere in this section of the *Review*.

Crop sciences continue to account for the largest portion of the Division's budget including, for instance, a food legume network and a cropping systems research network, which began in South-east Asia, and is now expanding into the High Andes of South America, into Central America, and into Africa.

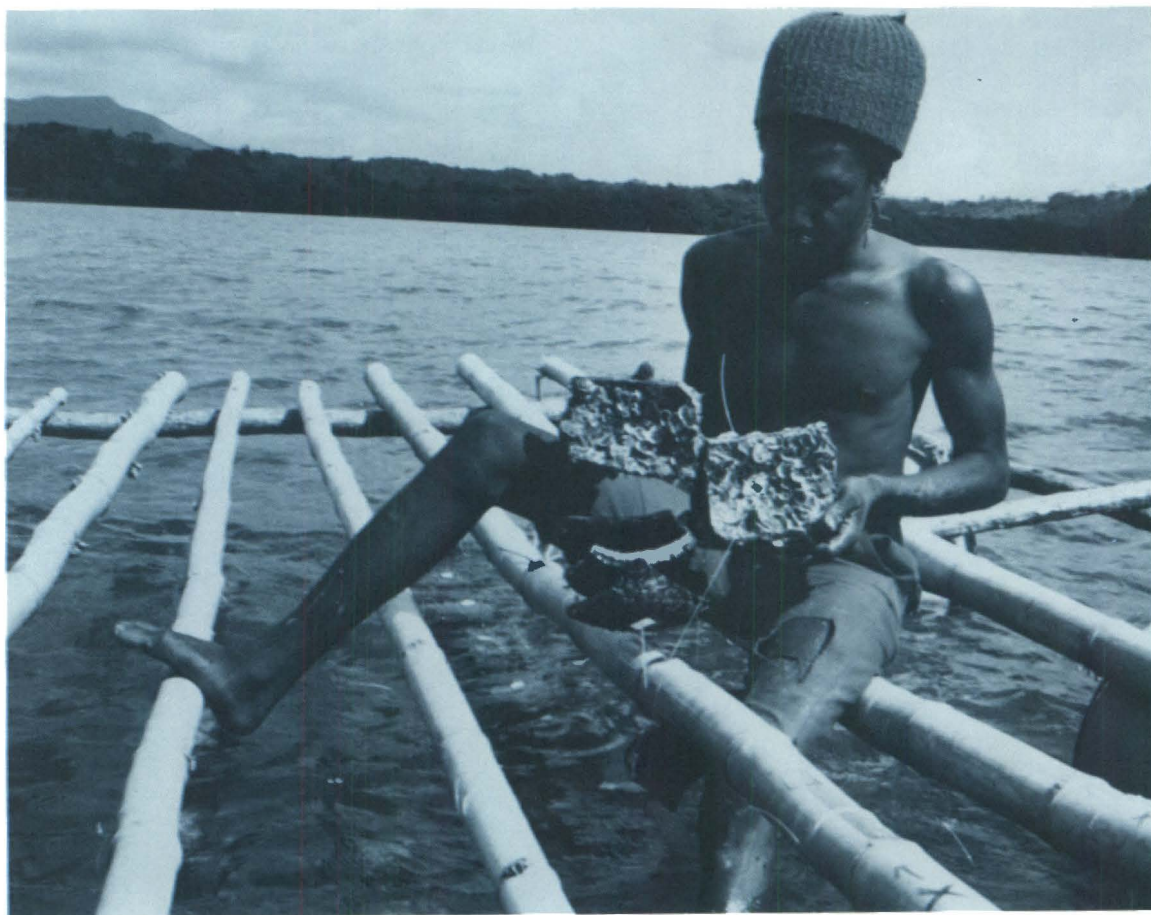
*Kenya: trees and food crops together can maximize the land's potential.*



Growing several different crops — together or in sequence — on the same piece of land during a single year is one way of increasing productivity. In Bangladesh, Sri Lanka, and Thailand, IDRC-supported projects aimed at designing and testing rice-based cropping systems for small farmers all began second phase operations during the past year. In the first phase researchers were able to increase the number and yield of the crops produced; in the second phase the successful experimental systems will be more widely tested and extended to large numbers of small farms. The researchers have made detailed studies of the economic and social factors that influence the adoption of new systems.

All three projects are part of the cropping systems research network coordinated by IRRI, the International Rice Research Institute in the Philippines, which pioneered much of the cropping systems research. A 3-year IDRC grant to IRRI will continue support for an outreach program to strengthen the interaction between the small farmers of Asia and the national and international scientists.

In Costa Rica and El Salvador the Centre is supporting a 3-year research program as part of an evolving cropping systems network in semi-arid areas of Central America. The aim is to maximize food production in a region that is at present unable to provide even the mini-



*Jamaica is one of several countries experimenting with raft oyster culture.*



mum requirements for an expanding population. In Africa a grant to the University of Swaziland will enable an interdisciplinary research team to examine the traditional mixed cropping systems used by African farmers. The team will develop improved systems to increase small-farm production not only in Swaziland but throughout most of the region.

In the area of fisheries, one of the most successful projects to date has been at the Southeast Asian Fisheries Development Centre (SEAFDEC) in the Philippines. It was here in 1976 that the milkfish was bred in captivity for the first time. That feat has since been repeated many times by scientists at SEAFDEC, and in the 3-year second phase of the

culture potential.

In Africa, aquaculture projects in Egypt and the Sudan are now well under way, and, in Latin America, project personnel working in Peru, Ecuador, and Colombia on shellfish and mariculture production are organizing their field observations. The Guyana shrimp by-catch program has now entered a second phase, which is concerned with standardization of methods for large-scale production of stable fish products.

The forests of the Andean region of South America contain about 650 species of timber, of which as many as 400 may be of commercial value. At present, only about 50 species are used commercially, and stranger still, in a region where there is a growing shortage of adequate housing and an abundant supply of timber, wood is rarely used in home construction. In 1975 the Centre began supporting the first joint research project of the Andean Pact countries (Bolivia, Colombia, Ecuador, Peru, Venezuela) with the aim of developing the potential of at least 100 of the untried wood species.

The project, now nearing completion of its second phase, has already done much to determine the physical and structural properties of species available throughout the region and has provided the data needed to make better use of forest resources. The project has also created uniform standards for the region, helped to create new research facilities in three countries, and, perhaps most important, has stimulated the interest and commitment of governments of the region to a greater use of forest products.

The experience gained in the Andean Pact project will provide the basis for similar research in a new Centre-supported project in Mexico. Aimed at providing grading rules and design stresses for a large number of lumber sizes, the project will benefit from the services and knowledge of two Canadian experts and is expected to be only the beginning of a large program for the Central American region.



*The bark of the African baobab tree is a by-product that has many uses!*

project, now under way, they hope to improve their techniques to the point where a reliable supply of fish fry can be made available to the region's many milkfish farmers. Milkfish are of major economic importance to much of Southeast Asia, but their refusal to breed in captivity has long been a constraint to expansion of the industry. A related program on carp breeding in Malaysia has also been very successful in spawning carps in all months of the year, the first step toward domestication and genetic selections. Based on these successes, programs are being initiated to breed other indigenous fishes that show aqua-



In the developing countries, animals — an important source of protein — compete with people for land and food. One of the main thrusts of the animal sciences program, therefore, has been to support research to develop livestock feeds from agricultural by-products. In Latin America, for example, researchers are feeding cattle diets based on the waste products from two of the region's major crops, sugarcane and coffee beans. In Egypt another project is using by-products from crops such as cotton, maize, rice, and sugarcane in experimental feeds, with some success. And in Kenya a project begun this year will help to increase rural poultry production by developing nonconventional feeds using agricultural by-products and wastes.

Another approach to the problem is the development of pasture legumes to make use of poorer soils that will not support food crops. Pasture legumes not only provide fodder for cattle and increase productivity but also improve the quality of the soil in which they are grown. IDRC has supported several research projects on pasture legumes since 1972 and in the past year approved a grant for a major pasture legumes research program to be carried out by the International Center for Agricultural Research in the Dry Areas (ICARDA), which was established with IDRC support in 1975. Through the development of pasture lands in the arid regions, an important step can be taken toward reducing the spread of the deserts.

*An Egyptian researcher watches dairy cattle eating by-product feed mix.*





## Legumes no longer neglected

Imagine a plant that grows rapidly, produces prolific quantities of high-quality protein, and has edible pods and leaves. For good measure, make the plant highly tolerant to stresses such as drought and heat, and give it the ability to extract nitrogen from the air, thus fertilizing the soil in which it grows.

So remarkable a plant, you might think, would have to be the product of highly developed modern agricultural research and technology. Not so. This "wonder plant" is the humble cowpea, which originated in Sahelian Africa thousands of years ago and has gradually spread throughout the tropics.

Nor is the cowpea unique. It is just one member of the family of food legumes that includes chick-peas, broad beans, lentils, pigeon peas, mung beans, and black grams, to name only a few. They share many of the same valuable attributes.

Food legumes are an important part of the diet of millions of the world's poorest people, for they provide the protein and essential amino acids that are otherwise lacking in diets based on root crops or cereal grains. Yet the improvement of many food legumes has been largely neglected by agricultural research until quite recently. And consumption of food legumes has actually declined in Africa and Asia — a cause for serious concern in regions where poor nutrition is often as much a problem as lack of food.

The world centre with responsibility for research to improve the cowpea is the International Institute of Tropical Agriculture (IITA) in Nigeria. In cooperation with IITA the IDRC is supporting pro-

jects in several West African countries as part of a program to test new, high-yielding, disease-resistant cultivars as widely as possible.

During the past year IDRC has also cooperated with IITA to produce a 16 mm film on the international cowpea improvement program. The 23-minute film, entitled *Pods of Protein*, is being widely shown to researchers, planners, and educators as part of the Institute's continuing efforts to encourage both production and consumption of cowpeas in the semi-arid tropics.

In the Middle East and North Africa, chick-peas, broad beans, and lentils are the principal legumes. In fact the broad bean is often known as "the poor man's meat" in this part of the world. Here the



*Food legumes are an essential source of protein for families in Africa.*



main centre for food legume research is the International Center for Agricultural Research in the Dry Areas (ICARDA), which also serves as a training centre for young scientists and technicians from the region. ICARDA maintains close links with the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) in India, which has responsibility for pigeon pea and chick-pea improvement.

In IDRC-supported projects in Egypt and Sudan the main objective is to increase yields. Egypt is particularly hard-pressed because of the limited amount of land suitable for agricultural production. Broad beans are a staple for many people, but yields are generally low. Egyptian researchers, many of them trained at ICARDA, believe that production from the country's 200 000 hectares of food legumes could be doubled. They are concentrating on the problem of low yields, whereas in Sudan the main emphasis is on developing stable yields.

In Bangladesh a great deal of attention has been paid to rice research, but food legumes have again been largely neglected. Now IDRC is supporting the Bangladesh Agricultural Research Institute in a food legume improvement pro-

gram that will make use of the best of the local varieties as well as evaluate legumes from other countries that may be adaptable to conditions in Bangladesh. The Institute's researchers will receive training during the project at ICRISAT and IITA to enable them to take full advantage of the experience already gained in other countries.

Since 1971 the Centre has supported more than 30 projects dealing directly with food legume research. Because of the rapid growth rate of legumes (some varieties mature in 60–70 days), and their nitrogen-fixing ability, they are an ideal component for multiple cropping. They are often intercropped with maize, sorghum, or other cereals, or grown between the first and second rice crops. IDRC supports a worldwide network of cropping systems research projects, many of which include food legumes as a component, and, thus, benefit from the legume improvement program.

The greatest benefit however goes to the rural poor of the developing world, especially to the children, for it is they who are usually the first victims of malnutrition. Food legumes mean protein and, in turn, a more balanced diet and ultimately healthier children.



*Intercropping cowpeas and maize at IITA in Nigeria.*



## Getting the harvest home

In the past 30 years agricultural research in the developing world has made remarkable progress. Scientists have developed new varieties of cereals that provide higher yields, mature earlier, and are resistant to certain pests, diseases, and drought. Research has also resulted in improved cropping practices, such as multiple cropping, intercropping, and new crop rotation techniques, which have added greatly to the crop yields.

The beneficial impacts of these advances are, however, to a great extent offset by the tremendous losses that occur during and after the harvest. In some countries these losses are estimated to be as high as 30 percent of the total food production. You do not need to be a mathematician to calculate that farmers who lose one-third of their crop this way must increase production by 50 percent simply to replace their losses.

If the farmers could somehow reduce postharvest losses, their food supply would increase dramatically even without increased production. This seemingly obvious fact was, for a long time, largely ignored by researchers and administrators. Since its inception, IDRC has been one of the leaders in encouraging and promoting research into postharvest technology. The Centre pioneered an integrated approach to reducing postharvest food losses, in what is now known as the postproduction systems (PPS) program.

The program supports research on all stages in the food system from the moment the harvest is in — whether it be rice or fish, fruit or nuts. The basic stages include threshing, drying, storage, processing, transportation, marketing, and utilization.

Sorghum, for instance, must first be dried. Then it is stored until needed, when it is threshed and milled, either by hand or by machine. The sorghum meal may have to be stored again, it may be marketed at this stage, or it may be used to bake bread for sale at the market to meet the growing demand for prepared foods. At any of these stages it may have to be transported — from field to storage, from storage to mill, from mill to market, and so on. It is a complex process.

One of the earliest projects in this program was the development of a pilot commercial grain milling system at Maiduguri in Nigeria. The aim was to develop a viable mill that could process local



*Village-scale milling technology is being adapted for use in Botswana.*



grains into a product as good as, or better than, that produced by the traditional process and thus reverse a trend toward buying imported, processed grain products. With technological assistance from both the University of Saskatchewan and the National Research Council of Canada's Prairie Regional Laboratory, a milling system, revolving around a dehuller that can handle most indigenous grains, was developed at Maiduguri. A test kitchen and bakery were added at a later stage, and the government of Nigeria has now established a second mill at Kaduna as a prelude to a string of such mills throughout the country's grain-producing areas.

Much of the experience and some of the technology developed in the Maiduguri project are now being further tested and adapted in two projects in Botswana. The government's ambition is to attain self-sufficiency in grain production — an ambition that demands not only commercial but also village-scale milling operations. The village mill being developed is a scaled-down version of the one used on the larger project. It will be tested at three different sites under the management of the villagers themselves. If successful, the mill will be of particular value in many developing countries, where the farmers want to grind small quantities of grain for their own use.

Energy is also an important factor in the postproduction system. Many of the processes used in the industrialized nations have a high energy requirement that makes them extremely expensive. The Centre is supporting research to develop appropriate methods, such as the use of solar energy for drying fruits and vegetables in Egypt, potatoes in Peru, onions in Niger, and fish in Mali.

Another source of energy is waste products. Examples are the use of rice husks to fuel a mechanical grain dryer and the use of coffee pulp in the production of methane to fuel a crop dryer.

Wherever possible, IDRC aims to improve existing technologies rather than replace them with new ones. This is very

evident in a research project in Senegal. At the Bambey Agricultural Research Station, there is a unique collection of grain storage bins. Patterned on traditional designs borrowed from all over the region, many feature simple modifications that greatly improve their efficiency. The aim of the first phase of this project, started in 1973, was to find practical, inexpensive technologies for drying, storing, and processing grain. In the present second phase, the developed techniques are being tested where it counts — in the villages. The components have been combined into two "packages" — one for large and one for small villages.

In the villages, children are usually the first victims of malnutrition. For the malnourished child, minor illnesses are potential killers, and the child is never more vulnerable than when being weaned. In three Thai villages, the Institute of Nutrition of Mahidol University, supported by IDRC, has set up experimental food processing centres where parents can make infant foods. Recipes are being developed using locally produced legumes and vegetables, and after the experimental period, it is hoped to expand the program into 26 provinces designated "nutrition priority" areas.

Several research projects are under way to develop economically feasible, suitable technology for the small farmer. These projects have been set up in such a way as to ensure as much as possible that the resulting implements can be manufactured by small-scale industries or local artisans from available materials. This will provide needed off-farm employment and reduce the dependence on imported equipment, much of which is expensive and impractical for the small farmer.

The postproduction systems program brings together all these elements in an integrated program with the aim of making the best possible use of all the food the farmers can grow. A full account of this program is given in a newly published IDRC booklet *Food Systems* (IDRC-146e).



## Information Sciences program

IDRC is one of the very few development assistance organizations to have a program and budget specifically devoted to the information sciences, which has permitted it to become something of a leader in this field. During the 1978–79 fiscal year the Information Sciences Division supported 20 new projects and, over the past 9 years, has been responsible for about 12 percent of the Centre's project budget.

The work of the Division is wide ranging, and its choice of subject areas often reinforces the activities of the other three program divisions:

- Support for international information systems, either global or regional, with particular emphasis on assisting developing countries to participate in, contribute to, and benefit from such systems;
- Support for specialized information centres dealing with topics of importance to international development;
- Improvement of library services, including operation of IDRC's own library to serve as a resource for both the Centre and the development community;
- Industrial extension services, especially for small-scale or rural-oriented industries in developing countries;
- Cartography, especially the development of teams to apply the data obtained from satellites in order to produce thematic maps; and
- Computer science, the application of data-base management systems to the



storage and retrieval of information in developing countries.

The director of the Division since its inception has been John E. Woolston.

### The year in brief

International cooperation in information work has remained the main focus of the Information Sciences Division over the past year, particularly through co-operative bibliographic information systems. The "territorial formula," by which each participating country processes only its own documents, results in an equitable sharing of costs. In return for contributing its bibliographic records to the system, the country gains access to the literature of the rest of the world.

The program provides support mainly to regional centres acting on behalf of their member governments. The Agricultural Information Bank for Asia, which is linked to AGRIS, the FAO's global agricultural information system, has received an IDRC grant for a third phase of operations. Like its counterpart in Latin America, the Asian network is adding to its previous activities, making greater application of computer methods and building new services to deliver documents in response to specific requests.

In the field of population information, the regional centre for Latin America received a second IDRC grant. The objective of the second phase is to decentralize some of the document collection and recording activities to national cooperating institutions. A first grant



has also been awarded to an African regional centre for population information.

Both of these centres could eventually form part of a worldwide population information system, POPIN, the design

in defining a program to be known as DEVSIS Africa.

In a large project covering the information from all sectors in one geographic region, IDRC joined several other donors



*Latin America is a leader in documenting basic population information.*

of which was studied in some detail by the United Nations Population Division with the assistance of an IDRC staff member seconded for the purpose.

For the information needed by development planners and policymakers, IDRC is continuing a demonstration of the proposed Development Sciences Information System (DEVSIIS). In the last year, the demonstration has resulted in a joint bibliography and index to the Canadian and West German development literature.

At the same time, several other countries have been producing indexes to their own development literature and several are joining the demonstration managed by IDRC. Meanwhile, with IDRC support, the Economic Commission for Latin America has launched a similar demonstration with the participation of 10 ministries of planning. At the request of the Economic Commission for Africa IDRC managed a group of consultants

in funding the planning stage of an information network for the Sahel. The project is intended to enable the eight member countries of the *Comité Interétats de Lutte contre la Sécheresse Sahélienne* to share information pertaining to the common problems of the Sahelian drought and at the same time to help them develop national information policies and infrastructures.

In addition to the documentation aspect of international information systems, the Division also continues to support the use of a common computer system for bibliographic manipulations. ISIS, a package of computer programs originally developed by the International Labour Office for information retrieval and library management, is now used by many institutions, both national and international, some of which have drawn on IDRC for technical advice.

ISIS resource centres have also been established in Pakistan and Costa Rica,



both with some assistance from IDRC. These will serve as sources of expertise, as training centres, and will also process records from international and regional systems.



*Microfiche storage unit in Tunisia contains thousands of publications.*

For its own bibliographic processing in Ottawa, the Division has now been operating for more than a year with MINISIS. This is an ISIS-related bibliographic system, designed by the Centre's computer scientists, and is described in more detail elsewhere in this section of the *Review*.

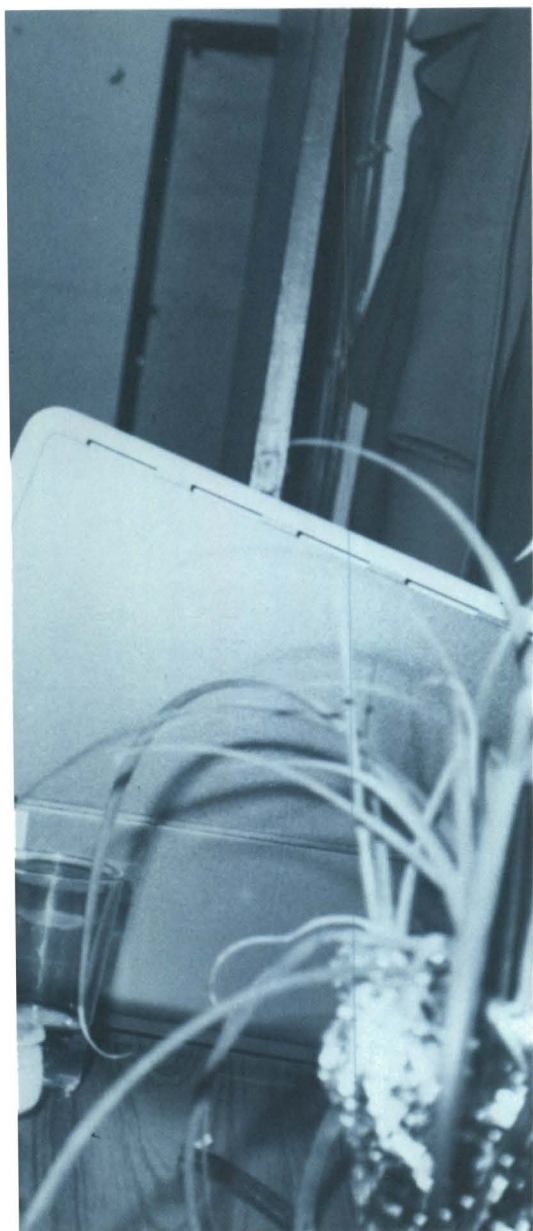
MINISIS is also being used in Ottawa to produce several special bibliographies, including *Devindex*, the index of the DEVSIS demonstration, and SALUS, a bibliography on low-cost health care and health manpower training. The documents listed in these bibliographies are now being reproduced on microfiche so that a complete collection can be donated to appropriate institutions at the same time as the records on computer tape. The microfiche unit set up for this purpose can also provide single microfiche copies on request to institutions that have the facilities to "read" these postcard-sized pieces of microfilm. The cost savings in mailing alone for this type of document distribution are remarkable.

*Learning to use MINISIS: it's a "user friendly" computer system.*





## Minicomputer cuts problems down to size



It is certain that somewhere in the developing world, perhaps in different countries, maybe even on different continents, right now two independent teams of researchers are diligently attempting to solve the same problem.

They are doing this, not because they are in competition — quite the reverse — they are doing it simply because neither team is aware of the other's existence. It is also more than probable that the solution to their problem has already been found by another research team in another country.

The situation exists in reality hundreds of times over, and it illustrates the importance of rapid communication among scientists. Developing countries, with their scarce resources and limited research capacity, can ill afford the waste of time and money that results from such duplication of effort, nor for that matter, can the industrialized countries, with all their resources.

The answer is global information networks that carry the latest research data swiftly from one country to another. One of the most advanced of such networks is AGRIS — the international information system for the agricultural sciences and technology. Operated by the UN Food and Agriculture Organization, AGRIS was established with considerable support and assistance from IDRC. It became fully operational in 1975 and now handles more than 100 000 “pieces” of information each year.

The principle behind such systems is simple. Each country (or region) puts in all the data it has available and, in return, gains access to all the data avail-

able from other participating countries. Because of the sheer volume of information, such systems must be computerized to operate efficiently, and, in the past, this meant high costs in computer equipment and programs. What was needed was a small computer with a program that could cope with a big job at a relatively low cost. IDRC's computer scientists undertook to try to develop such a package.

It took 2 years, and the end result was MINISIS, "a minicomputer based information management system." The name is derived from ISIS — Integrated Set of Information Systems — developed earlier by the International Labour Office for use with a full-size computer. MINISIS performs all the same functions but on a much less expensive minicomputer.

The MINISIS package offers many advantages in addition to low cost; perhaps the greatest is its versatility, which enables it to be used for many different applications, including many library management functions. Also important, MINISIS is what computer scientists call a "user friendly" system. In other words, it is easy to learn, even for those with little or no experience of computerized information systems.

In fact, MINISIS is such a good system that it has attracted considerable interest not only from the developing countries, as was intended, but also from governments and institutions in the industrialized nations — including Health and Welfare Canada. Most significant of all, the ILO is planning to replace its ISIS with MINISIS, at considerable savings.

In short, MINISIS is a breakthrough in bibliographic information processing. But if the developing countries are to be able to benefit from this advance, they need to be able to obtain experience with the system through on-the-job training. To provide this, IDRC hopes to establish MINISIS resource centres at strategic locations around the world, preferably at institutions that already have major programs of information processing and computer science, and, where possible, in association with postgraduate schools of information science.

Considerable interest has been shown by the francophone countries of Africa — in fact Tunisia and Zaire have already acquired minicomputers with the intention of installing MINISIS programs. Specialists from both countries spent 2 weeks in Ottawa being trained on the Centre's minicomputer. In response to the interest from francophone developing countries, the Information Sciences Division earlier this year drew up a 2-year project to provide training and documentation for MINISIS in French and to ensure a capability for implementing and maintaining the program on minicomputer installations in francophone countries.

Computer science is advancing rapidly, and it is quite conceivable that the minicomputers will eventually be overtaken by the advent of microcomputers, which will be even less expensive. If and when that happens, many of the developing nations will already have gained the experience with MINISIS that will enable them to continue taking advantage of the latest technology.



## Social Sciences program

Second largest of IDRC's program divisions, accounting for almost 30 per cent of the project budget over the past 9 years, is the Social Sciences Division.

The social sciences program is concerned primarily with the planning and implementation of development: how people are affected by the development process, how they respond, and why. Such information is vital to the preparation of effective plans and policies to bring about rapid development.

The Division's research support is focused in four sectors:

- Economics, concentrating particularly on economic policy and its impact on development, agricultural development, impact studies, labour supply and employment, and regional development studies;
- Education, including research related to the basic cycle of education, studies on the transition from school to work, and encouragement and utilization of educational research;

- Population and development policies, including research into population redistribution, determinants of fertility and mortality, studies of family planning programs, and some problems of urban development; and
- Science and technology policy, concerning issues such as national technology choices, the effects of technical change, the diffusion of technology, and markets for technology as they relate to both industrialization and to rural development needs.



The present director of the Division, David W. Steedman, was appointed in October 1978.

### The year in brief

During the 1978-79 fiscal year, some 40 social science research projects were approved by the Centre's Board of Governors.

A number of changes took place within the Division in 1979, including the amalgamation of several programs and the addition of new areas of responsibility. This process, which is in response to the evolving needs of developing country researchers, is expected to continue during 1980.

In the past, the Division has concentrated much of its research support in Asia and Latin America, primarily because there already exists a relatively strong demand for social science research in these regions. During 1979 more emphasis was placed on developing research projects in Africa and the Middle East. This thrust will continue in part with a series of smaller projects that



*Study of social organization in African villages helps remove constraints.*

should help to develop a stronger social science research capability in these regions.

Not that such involvement is new. In Africa, for example, IDRC helped in 1976 to establish the Council for the Development of Economic and Social Research — the first voluntary scholarly organization on that continent to serve both the anglophone and francophone countries. The Council continues to receive IDRC support on a declining scale. It now has 49 active member institutions in 25 countries and aims to identify and encourage policy-relevant social science research in Africa.

The Division's support for science and technology policy research has earned the Centre a worldwide reputation in this field. In the past year the Centre began funding a new 2-year study linking six Central American countries in a co-operative effort to increase the effectiveness with which science and technology can contribute to the region's development objectives. In the Caribbean a similar project to establish the scope and limits of science and technology in that region entered a 2-year second phase that will attempt to define the region's technological capabilities in specific sectors.

The Division's concern with the processes of modernization and change also extends to the agricultural sector. In West Africa IDRC is supporting ICRISAT (International Crops Research Institute for the Semi-Arid Tropics, based in India) in a series of agro-economic studies. Based on earlier research in Indian villages, the African village studies will seek ways to remove constraints to development by studying such factors as cropping and labour patterns, farmers' attitudes, social organization in the villages, and access to markets. In Brazil, where the transformation of the agricultural sector has succeeded in making the country a net exporter of food, there are indications that employment in the sector may actually have declined. The Centre is now supporting a study of the impact of Brazil's agricultural development on the labour market — a study that may prove

to be a model for several other Latin American countries undergoing similarly rapid change.

Another indicator of modernization and change is fertility. In Sierra Leone, where research on population dynamics and policies is in its infancy, the Centre is supporting a 2-year study of fertility patterns in four rural chiefdoms. By providing accurate data on fertility levels and the use of and attitudes to various forms of contraception, the survey will contribute to the provision of adequate medical and family planning services in the country. Five countries are participating in a joint project, now in its second phase, to examine the cultural factors determining fertility levels and contraceptive use in the multiethnic societies of Southeast Asia. The second phase will further test the hypotheses developed in phase one and report on the policy implications of the researchers' findings.

Education is an expensive but essential element in the development process. How best to utilize the funds available for education is a question of vital concern to all developing countries. In Nigeria, IDRC is supporting a 2-year project to analyze systematically the teacher's role and to develop a low-cost, reliable method for monitoring and improving teacher performance. The research will be carried out by the West African Examinations Council, an organization of five English-speaking countries. A Latin American study will attempt to determine the impact of preschool programs on grade one performance. The project, involving four countries, should help to solve the problems caused by slow progress and repetition in the early grades, where children may require an additional 3–4 years to complete a primary education. A related project in the Philippines will test the retention of literacy and numeracy skills among primary school-leavers. The project is one of several in different countries supported by a group of donors in an international effort to find the "threshold level" of schooling.

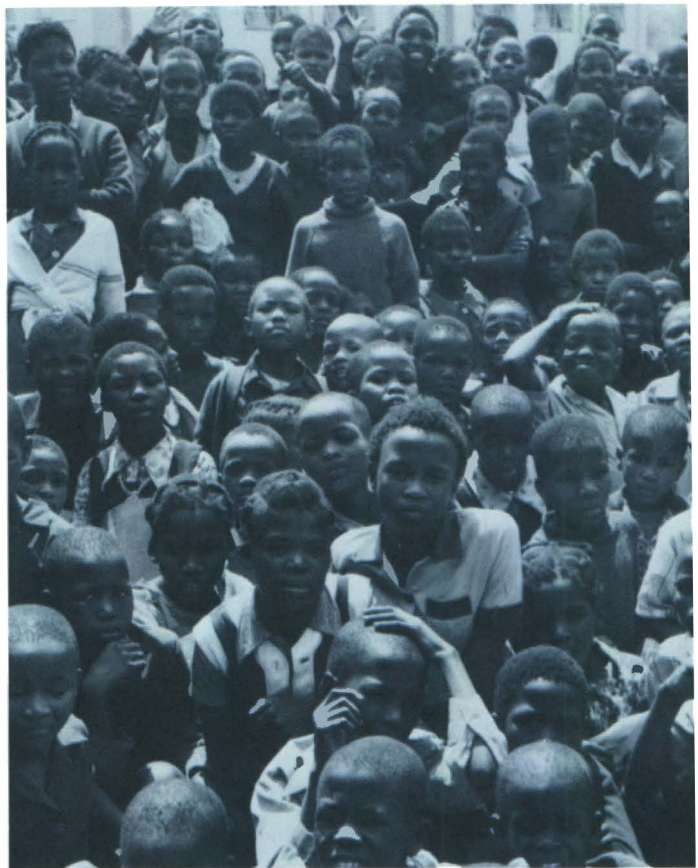


## Learning about learning

For many developing countries the cost of bringing Western-style universal education to all their people is so high as to make the goal virtually unattainable. The result is immense waste, for all those millions of bright young persons who will never acquire even the basic skills of literacy, or who are prevented from reaching their full potential, represent an untapped human resource. There lies the dilemma — developing countries cannot afford to provide the education their people need, and they cannot afford not to.

A good deal of research has been carried out around the world in an attempt to solve educational problems, but for the most part it has been scattered and uncoordinated, and the results have often been neglected or never made available to the policymakers and others who could act upon them.

Recognizing the dimensions of this problem, IDRC decided to begin with a basic approach: to review and bring together results of research carried out in, or of special interest to, the developing countries. As a first step, the Research Review and Advisory Group was formed. It consisted of 10 independent researchers from Africa, Asia, the Caribbean, the Middle East, Europe, and North and South America. Their assignment: to review the present state of educational research as this relates to the educational problems of developing countries; to identify both the major advances and the significant gaps in research to date; and to present their findings in a manner that is useful both to researchers and policymakers in devel-



*The future of the developing countries lies in their human resources.*

oping countries and to the international funding agencies.

The task proved to be a formidable one. To reduce it to manageable proportions, the Group agreed to focus on basic education (generally primary level schooling), in recognition of the fact that primary schoolchildren are by far the largest group in the school system in developing

countries and account for the largest proportion of the education budget. Yet they often leave school without having acquired even the most essential of educational skills: literacy. The Group also initially limited its explorations to research on the organization and conduct of learning. It was still left with a mountain of material to gather and collate.

A hectic 2-year program has seen numerous achievements. No fewer than 26 large-scale studies on scholastic achievement were synthesized in a single volume, as were seven regional and national reviews on teacher effectiveness. Workshops were held both to inform and to learn from researchers, educators, and policymakers in Southeast Asia, Latin America, and West Africa. Educational information networks have been identified and strengthened in Africa, Asia, Latin America, and the Middle East, and summaries have been prepared of research findings on topics such as adult literacy, malnutrition and its effects on intellectual development, and the relationships between education, work, and employment.

From these and other activities have emerged numerous findings — some of them surprising, others confirming long-held suspicions. For example, according to many of the studies reviewed, the number of students in a class has no significant effect on learning and teachers' academic qualifications, such as university degrees, do not relate to either the teachers' performance or the pupils' achievement. Another finding was that women teachers tend to perform more effectively and to be more satisfied with their profession than do their male colleagues. Factors such as social and economic status, health, nutrition, and parents' educational level were all found to exert an influence on learning in developing countries as elsewhere — although the connection between "low" socioeconomic status and low scholastic achievement appears less marked than in developed countries.

Perhaps the Review Group's most

significant achievement — and one with the greatest implications for research in other areas of the social sciences — resulted from its early and deep concern with the "research process." This the Group defined to be all the stages in a research activity, from inception to use of results. Through detailed study of the many elements involved, the Group was able to formulate hypotheses about the development of "educational research capacity" on a national scale. Preliminary application of these hypotheses indicates that further research in this field would be useful in the development of a stronger national research community.

These are just a few examples of the Group's findings, many of which have already been published in a series of reports and summary reviews aimed at developing country researchers and government departments concerned with educational research priorities, at international funding agencies, research organizations, and the like. Reactions to these papers, together with the Group's recommendations for future action, will be contained in a final report, now in preparation, which will be published and widely distributed by IDRC in 1980.

In the final analysis, research is of little value unless it is used. To be used, it must be practical, understandable, and above all available, not only to that ill-defined figure the "policymaker," but also to other researchers, educational administrators, teachers, students, parents — in fact to the public at large. All are potential participants in, and audiences for, educational research.

If the work of the educational Research Review and Advisory Group achieves nothing more than to increase the availability of research results in developing countries and to broaden awareness of the participatory nature of the research process, then it will have made a considerable contribution. For this in itself is a major step toward helping the developing countries tap the greatest of their natural resources — the talents of their own people.



## Peopling the new frontiers

There are still frontiers in the world — areas that for one reason or another are underpopulated and underdeveloped but have great potential. Canada's North is one. Most such areas are in the developing world, usually inhospitable regions of jungle or desert, mountain or swamp.

The Sudd is one example. Africa's largest swamp, it covers some of Southern Sudan, is virtually impassable, and has been described as one of the most hostile and water-wasteful environments on earth. Or there are the dense jungle river valleys of the Brazilian interior, key to a vast region with immense resource potential, yet just as remote, hostile, and inaccessible as the swamps of Sudan.

These regions, and others like them throughout the developing world, are at last starting to be developed. Properly exploited, they could well provide the additional agricultural and other resources to turn around the economies of many developing nations. Given the right kind of development, even the desert may be made to bloom.

The one ingredient essential to the success of any frontier development project is people. Invariably such projects involve the movement of large numbers of people into the frontier area, and inevitably such large-scale development affects the lives of those people who already inhabit the region. The human element of frontier development is an extremely sensitive factor that is of particular concern to project planners and managers who know that their projects stand the greatest chance of success if their people are properly motivated. The Centre's Social Sciences Division has

supported several research studies in this field in recent years, and it is an area of increasing activity for the Division's population and development policies program.

Many developing countries are trying to open up new territories by providing incentives for people to move out from the overcrowded cities and other densely populated areas. These efforts at redistributing the population have met with various degrees of success, as shown by a 2-year comparative study begun in 1975 and funded by IDRC in five Asian countries with the aim of finding out what works, what doesn't, and why. In 1976 a similar project to study and evaluate population distribution policies in seven Latin American countries was begun, also with Centre support, and the final meeting of the participating researchers was held in Colombia in March this year. Each country studied one particular aspect of its policy and program development. Based on the experience gained, a further project has been drawn up to provide a regional policy overview of resettlement programs.

The new project will attempt to fill gaps in knowledge revealed by the earlier studies and will prepare reports on specific issues, such as land reform, resettlement, and colonization. Most important, it will provide government officials, planners, and community leaders with a broad regional perspective that should do much to smooth the path of future frontier development projects.

Brazil is one Latin American country with many such projects. The rapid influx of settlers and investments into



*Studies will reveal the likely impact of development on the local people.*

newly opened frontier areas has resulted in complex and often confusing situations, and even social conflict. Last year the government began planning the development of a new frontier area, the region around Sao Felix do Xingu, some 1100 km northwest of the capital, Brasilia. IDRC has agreed to support an independent study that will provide new perspectives on the socioeconomic impact of the project. It will be the first time researchers have been able to study the impact of such a project from its beginning. Their findings should help planners of future developments avoid many of the pitfalls of the past.

The Government of Sudan in the past 20 years has had considerable experience in encouraging the movement of populations away from the sites of the major engineering projects into new towns or agricultural development schemes. Researchers have evaluated each major resettlement project and made recommendations for the benefit of administrators and managers. Now with the aid of an IDRC grant they are attempting to find out how much effect their reports have. Are they read? Are their recom-

mendations acted upon? And if not, why not? Overwork? Disinterest? Inability to comprehend results? Lack of resources? It is a unique effort to ensure the usefulness and practicability of research, with the ultimate aim of designing an "optimum resettlement model." Such a model could have worldwide applications but would be particularly useful in Sudan's newest large-scale development project — the Sudd.

There have been plans to tame the Sudd for more than 50 years, but it was not until 1974 that the governments of Egypt and Sudan agreed upon a plan to construct a major navigable canal and a smaller parallel irrigation canal that will partially drain the Sudd and provide huge amounts of additional water to both countries. Costs for the construction of both waterways, a road that will follow the canal embankment, and the reclamation of swampland will exceed \$200 million. Sudan has allocated another \$45 million for irrigation schemes to use the water from the Sudd to open up 80 000 hectares of agricultural land.

Because all the construction will take place in Sudan, the Sudanese government was particularly concerned with the socioeconomic impact of the Jonglei Canal project. Top priority was given to a wide-ranging survey to discover the hopes and fears of the local inhabitants, the likely impact of the development on their lives, and to identify whatever services will be needed in the areas affected by the project. IDRC's contribution is small but important. At the request of the Jonglei Canal Commission, the Centre is providing assistance for the preparation and computer analysis of the survey data, and the writing and production of 11 reports based on the survey results, each dealing with a major policy-related sector. The reports, now in preparation, will be valuable to the various national and local government agencies and should ensure that the human element is not forgotten in what must rank as one of the most ambitious projects of its kind ever to be undertaken.



## Health Sciences program

About 15 percent of the Centre's project budget goes annually to the Health Sciences program. Since 1970 the Division has supported more than 160 research projects dealing with a wide range of health issues — from contraceptive vaccines to improved water pumps.

The majority of the Division's projects are concerned with the health problems of people in rural areas because these regions of the Third World have the greatest need. Doctors and hospitals are rare outside the cities. Many projects, however, are universal in their application, and there is a special concern for the plight of rural-urban migrants living in squatter settlements around major towns and cities.

The Division maintains worldwide links with other international agencies to ensure that its research results are shared. It also participates in major international research efforts such as the UNDP/World Bank/WHO Special Programme for Research and Training in Tropical Diseases and the work of the International Committee on Contraceptive Research.

The program focuses on four main areas of research:

- Rural water supply and sanitation, with emphasis on the development of water and sanitation technologies, management and social aspects of water supplies and wastes reclamation;
- Basic health services, including studies of rural health care needs, training and personnel needs, and support for pilot health care delivery programs;
- Fertility regulation, stressing the need for better and safer contraceptive methods and studies of possible side-effects of existing methods; and

- Tropical diseases, seeking biological and environmental control of some of the major tropical diseases through research at the national and international level.



The director of the Health Sciences Division, Dr John Gill, was appointed in 1975.

### The year in brief

The Health Sciences Division received Board approval for 29 new projects during the 1978–79 fiscal year, with a total appropriation of \$4 million. More than one-third of these projects dealt with the related fields of water supply and sanitation.

A plentiful supply of clean water and a suitable method of waste disposal are essential for the health of a community.



*Improving environmental health is a primary goal of the program.*

But they will bring little improvement in health if the people are not motivated to use them. The right technology needs to be combined with effective health education programs and basic health care. Research aimed at these aspects of environmental health is highlighted elsewhere in this section of the *Review*.

Sewers are an expensive way of handling human wastes and are not practical in rural areas where most people in developing countries live. In an effort to develop inexpensive alternatives, IDRC is funding a network of research projects. In Thailand, for example, there is a 2-year study to find useful methods of waste disposal, such as composting or the reuse of waste products as fish feed. A similar project in Guatemala will study composting and biogas production systems. In Zambia a number of existing low-cost sanitation technologies for use in peri-urban areas will be evaluated.

To provide rural communities with basic health care services and health education, IDRC has pioneered research in health care delivery systems in many parts of the world and continues to do so. In a new project in Indonesia, researchers are attempting to create a community health program and referral system for some 40 000 people who live in the "informal suburbs" of the big cities. In rural Bolivia a study is being made to determine the health problems facing three different geographic and linguistic rural areas, the existing resources for solving them, and the use now being made of these services. The information will help in planning improved services.

Water management and control of industrial wastes are equally important to a healthy environment. In Sudan the Centre is supporting a study of the social and economic aspects of water supply, which is being carried out by the University of Khartoum in four diverse areas of the country. As a first step toward improving rural water supply, the study will ascertain who controls the water and how. In Malaysia, where the rapid growth

of palm oil production has resulted in widespread pollution from oil mills, the Centre is supporting a year-long study aimed at developing affordable treatment processes and controls.

In the field of tropical diseases the Health Sciences Division continues its support for the UNDP/World Bank/WHO Special Programme for Research and Training in Tropical Diseases, which is concerned with eradicating the six major tropical diseases that affect millions of people in the developing world — malaria, schistosomiasis, leprosy, filariasis, trypanosomiasis, and leishmaniasis. In 1975 IDRC helped to bring together the task force that led to the establishment of the Special Programme. The Centre also seconded a senior staff member to help start the field research and has remained one of the Programme's strongest supporters during its early stages of development.

The Programme is now fully operational and is supporting an extensive series of research and training activities in numerous institutions in the developed and the developing nations. The future of the Programme is now secure for at least 5 years, and as a result this is likely to be the last year of IDRC funding. The Centre also continues to support a number of research projects concerned with diseases that are not presently covered by the Special Programme. These in-



*Effective health education programs motivate people to help themselves.*



clude a study in Indonesia of the increasingly prevalent dengue hemorrhagic fever and research in Guatemala on intestinal infections and related diseases that are often fatal in young children.

In the field of contraceptive research the Division supports a number of projects concerned with possible effects on health of contraceptive use. It also continues its support for the work of the ICCR (International Committee on Contraceptive Research). This consortium

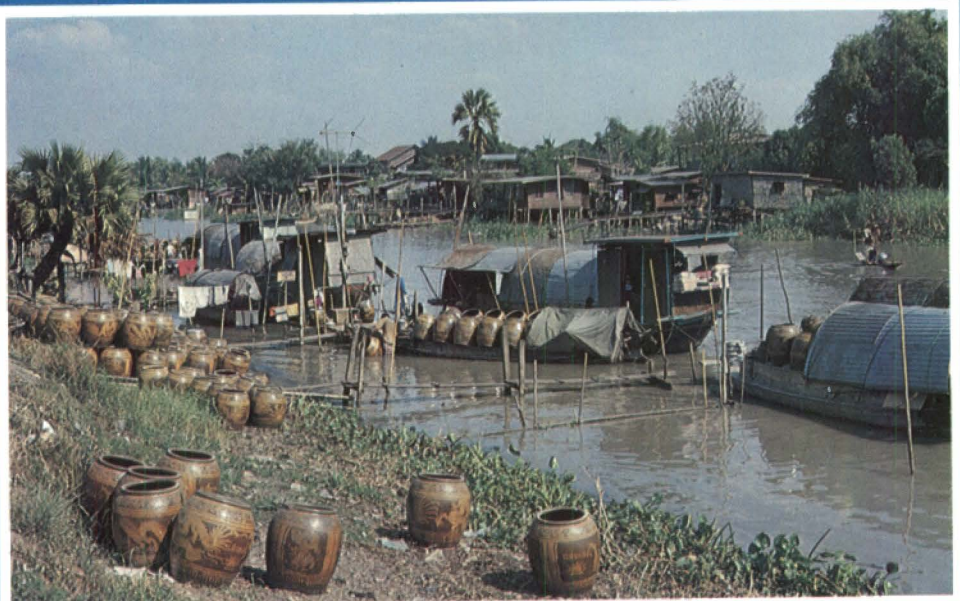
of top scientists from both the developed and the developing countries is jointly funded by a group of international donors, and during 1979 IDRC approved a grant for an additional 3 years of support. The Committee has already produced a number of promising new contraceptive technologies that are now being carefully tested. If all goes as expected, several of these new contraceptives could be available at reasonable cost within the next 2-3 years.



*Researchers in Guatemala question villagers on the children's health.*



*Children in Ethiopia sample clean water from a prototype pump.*



*Canal outside Bangkok: attractive to tourists, but dangerous to drink.*



## Toward a healthier environment

The city of Bangkok is laced with a network of large and small canals called *khlongs*. The *khlongs* provide an alternative to the city's overcrowded streets for transporting goods and people; they provide an attractive view of the city for tourists who stop and shop at the floating markets; and they are home for Bangkok's own boat people. They are also seriously polluted and a hazard to health.

Bangkok, with an estimated 4.5 million inhabitants, has no sewer system. Much of the effluent from cesspools and septic tanks and the few sewers that exist finds its way eventually into the *khlongs*, and thence into the Chao Phya River, turning it into virtually an open sewer and making its waters dangerous for drinking or even washing.

The problem Bangkok faces is by no means unique, nor is it peculiar to large cities. But it does demonstrate dramatically one of the most urgent, and least publicized, problems facing many developing countries today — the need for effective sanitation systems and clean water supply. We will likely be hearing a lot more on the subject in the next few years, as the 1980s have been declared by the UN as the International Water Supply and Sanitation Decade.

This dual problem has been a major focus for IDRC's Health Sciences Division for the past several years. On the water supply side, the Centre funded the development of a prototype plastic pump for use primarily in rural areas of developing countries. Designed at Waterloo University in Ontario, Canada, this pump is made of plastic because it is cheap, durable, and easy to manufacture locally

in Africa and Asia. Various versions of the pump are now being thoroughly field-tested in villages. This enables the designers to cope with such unforeseen problems as goats chewing on the spouts and small children dropping pebbles into the outlet pipe. The end result will be a water pump designed specifically for manufacture and use in developing countries. But it will only be part of the solution.

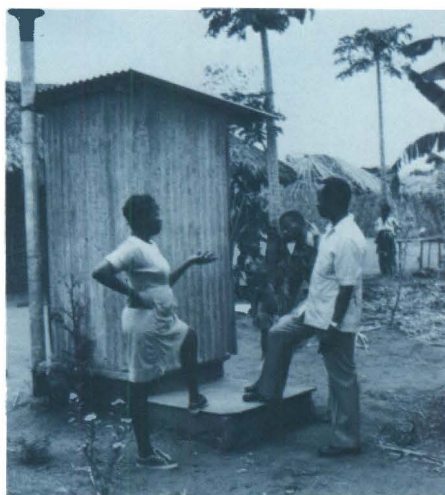
Most water supply projects in developing countries operate on the assumption that improved health will follow automatically once water is readily available. Recent studies indicate that there is no evidence to support this theory so long as the supply of water is seen as an end in itself. Many gastrointestinal and skin diseases are water-related; thus there is unlikely to be any significant improvement in health unless sanitation facilities, basic hygiene, and water use practices are also improved. In fact most villagers in developing countries simply defecate in the fields or bushes around their home, with a disastrous effect on the health environment.

The next step up the "sanitation ladder" is the pit latrine, but, unless properly built and maintained, this too may invite disease. If the pit is too deep, it may pollute the groundwater. Sewers are simply too expensive an option to be even considered. Between these two extremes there exist numerous other sanitation techniques, and many of these are now being studied and adapted in Centre-supported projects in Africa, Asia, and Latin America.

In Tanzania, where the government

plans to implement a nationwide program for latrine building, the Centre is supporting the second phase of village-level testing of a composting toilet that not only improves sanitation but supplies a humus that can be used as fertilizer. In neighbouring Zambia, Mozambique, and Botswana projects are under way to improve sanitation in the mushrooming squatter settlements around the major cities.

Thailand's problems in this field are not limited to the *khlongs* of Bangkok. Disposal of wastes in rural areas presents many of the same problems here as in Africa. In cooperation with the Bangkok-based Asian Institute of Technology, the Centre is supporting studies of selected methods of waste disposal. These include composting and the use of biogas digesters, as well as the potential reuse of wastes as fish feed in aquaculture programs. On the other side of the Pacific, in Guatemala, researchers are studying and adapting similar technologies with the aim of developing low-cost sanitation to improve health in isolated Indian communities. One particular advantage of this project is that it will test the working of the compost toilet and the biogas plant at altitudes up to 2500 metres.



*One of several low-cost latrines being tested in a Tanzanian village.*

In spite of their cultural and geographic differences, these projects and many others supported by the Centre's program have a number of things in common. Not least among these is the fact that, in addition to improving the health environment, each is designed to turn unpleasant, unhygienic wastes into useful by-products.

The Centre is also supporting research in several countries aimed at gaining a better understanding of all the factors involved in the complex relationships between water supply and sanitation. In the Indian state of Uttar Pradesh a large-scale rural water supply program is under way. One group of villages will receive an improved water supply. Another will receive water supply and a sanitary education program, and a third will receive both these inputs plus government help to construct an elementary drainage system. A fourth group of villages using traditional water sources will serve as a control. A related project in neighbouring Bangladesh will study similar combinations using hand pumps, latrines, and sanitary education programs.

The two projects should do much to resolve the debate on the impact of water supply and sanitation improvements. In addition, the research will improve and standardize practical methods for diagnosing water-related diseases and measuring the quality of the health environment.

Finally, again to Bangkok, where environmental health is a major concern, particularly in the estimated 250 "marginal settlements" — slums. The majority of the slum dwellers are squatters who have nowhere else to live. Most are willing to improve their communities, but they need help, and to give it to them, the city needs more information on just what combination of improvements will be most effective. IDRC is supporting a study of environmental, physical, and socioeconomic conditions in 20 slum communities that could provide a blueprint for upgrading squatter settlements in cities around the world.



The Centre has always placed great importance on the publication and dissemination of results of IDRC-supported research. The Communications Division produces a wide range of technical and scientific materials for worldwide distribution, particularly in the Third World, in addition to general publications and films to inform the public about the work of the Centre.

The following is a list of recent productions. Complete catalogues of current IDRC publications in English, French, and Spanish, and of available audiovisual productions, can be obtained from: Distribution Unit, Communications Division, IDRC, Box 8500, Ottawa, Canada K1G 3H9.

## Publications

*IDRC Annual Report 1978-1979. Rapport annuel CRDI 1978-1979.* Ottawa, Ont., IDRC, 1979. 61 p. IDRC-003/79e,f.

*Le Projet IMPACT: rapport intérimaire sur les projets IMPACT (Philippines) et PAMONG (Indonésie) organisés par l'INNOTECH.* Clyde Sanger. Ottawa, Ont., CRDI, 1979. 56 p. IDRC-088f. (Also available in English IDRC-088e)

*Housing Asia's millions: problems, policies and prospects for low-cost housing in Southeast Asia.* Stephen H.K. Yeh and A.A. Laquian, editors. Ottawa, Ont., IDRC, 1979. 244 p. IDRC-104e.

*Caqueza: living rural development.* Hubert Zandstra, Kenneth Swanberg, Carlos Zumberti, and Barry Nestel. Ottawa, Ont., IDRC, 1979. 321 p. IDRC-107e. (Also available in Spanish IDRC-107s)

*Coffee pulp: composition, technology,*

*and utilization.* J.E. Braham and R. Bressani, editors. Ottawa, Ont., IDRC, 1979. 95 p. IDRC-108e. (Also available in Spanish IDRC-108s)

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## Films

*Oyster farming in the tropics.* This film, mainly intended for instructional purposes, examines the methods and the problems involved in "farming" oysters. It includes scenes of oyster culture projects in Sabah, Malaysia, and Sierra Leone, and describes well-established systems in Japan and the Philippines. (28 minutes)

*Pods of protein.* This film documents the work being done to improve cowpeas, an important food legume that accounts for a large proportion of human protein intake in some regions of the Third World. The film demonstrates that any attempt to improve this traditional crop must take into account local tastes and food processing methods. (23 minutes)

*An end to pounding.* Traditional processing of sorghum — pounding with a mortar and pestle — is laborious and inefficient. This short, educational film tells the story of how a novel machine for removing sorghum hulls may bring a wide range of benefits to both producers and consumers in Botswana. (15 minutes)

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